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10/743,965	12/22/2003	Yoshihiro Nakami	MIPFP070	9367

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EXAMINER

PATEL, KANJIBHAI B

ART UNIT	PAPER NUMBER
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2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/743,965

Applicant(s)

NAKAMI, YOSHIHIRO

Examiner

Kanji Patel

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-11 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 7,8,12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/11/05, 11/25/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Information Disclosure Statement submitted on 10/11/05 and 11/25/05 have been considered by the examiner.

Drawings

2. Drawings submitted on 12/ 22/03 have been approved by the examiner.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

4. The disclosure is objected to because of the following informalities:

Page 2, line 13, change "nose" to -- noise--.

Page 8, line 26, change " Figure 4" to -- Figures 4(a)- 4(b) --.

Page 9, line 1, change " Figure 5" to -- Figures 5(a)-5(b) --.

Page 9, line 3, change " Figure 6" to -- Figures 6(a)-6(h) --.

Page 11, line 21, change "sense" to -- scene --

Appropriate correction is required.

Claim Objections

5. Claims 1, 5, 10 are objected to because of the following informalities:

Claim 1, line a, change "nose" to -- noise --.

Claims 5 and 10, line 2, delete second occurrence of word " parallel ".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 9-11 and 14-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (US 7,110,612 B1).

For claim 1, Wang discloses a method for executing a noise reduction process in digital images (Figures 5-6), the method comprising:

detecting the edges contained in an image (column 2, lines 4-14);

determining the orientation that is the direction in which the detected edges are formed (column 2, lines 15-33; Figures 1, 2A-2D and 3A-3D; 5-6); and

applying a smoothing filter to the detected edges (at least Figure 5; steps 518, 522, 526, 530, 532), wherein the smoothing filter has an extraction area (neighboring or surrounding pixels of the target pixel is an extraction area of the median filter which is used as a smoothing filter for edges; see abstract) in the same direction as the determined edge orientation (column 2, lines 33-65; column 6, lines 21-62).

Claim 14 is directed to an apparatus corresponding to the method of claim 1.

Therefore, this claim is rejected for the same reasons.

Claim 17 is directed to a computer readable medium that stores a program for executing a noise reduction process to digital images corresponding to the method of claim 1. Therefore, this claim is rejected for the same reasons.

For claim 2, Wang discloses the method, wherein the smoothing filter has an extraction area that is wider in the direction parallel to the orientation of an edge than in the direction perpendicular to the orientation of the edge (column 1, lines 34-42).

For claim 3, Wang discloses the method, wherein the smoothing filter is a median filter (Figure 5; column 2, lines 34-42; column 6, lines 37-62).

For claim 4, Wang discloses a method for executing a noise reduction process to images composed of a plurality of pixels (Figures 5-6), the method comprising:

finding the edge level (column 2, lines 42-61; gradients reads on edge level as defined in specification, page 10, line 4) in target pixels that are the object of the smoothing process (column 2, lines 42-65; column 5 line 42 to column 6 line 16; gradient calculation can provide an edge level as mentioned in the specification at page 10, line 4);

determining the edge angle that is the angle of an array of edge-forming pixels including the target pixels based on the calculated edge level (column 2 lines 15-33; column 4 line 23 to column 5 line 36; Wang identifies an edge or line by first computing directional operators or parameters associated with different directions, e.g., horizontal, vertical, diagonal, and anti-diagonal directions providing orientation which also reads on edge angle as defined in the specification at page 10, line 12);

obtaining a filter that has orientation properties extracting pixels in a given direction as reference pixels and matching the determined edge angle (column 2, lines 15-20; lines 33-65; column 6, lines 21-62) ; and

executing a first smoothing process on the target pixels using the filter that has been obtained (at least Figure 5; steps 518, 522, 526, 530, 532).

Claim 15 is directed to an apparatus corresponding to the method of claim 4. Therefore, this claim is rejected for the same reasons.

Claim 18 is directed to a computer readable medium that stores a program for executing a noise reduction process to digital images corresponding to the method of claim 4. Therefore, this claim is rejected for the same reasons.

For claim 5, Wang discloses the method, wherein the filter has an extraction area which is wider in the parallel direction parallel than in the direction perpendicular to a given direction (column 1, lines 34-42).

For claim 6, Wang discloses the method, wherein the filter is a median filter (Figure 5; column 2, lines 34-42; column 6, lines 37-62).

For claim 9, Wang discloses a method for executing a noise reduction process to images composed of a plurality of pixels (Figures 5-6), the method comprising:

finding the edge level in target pixels which are the object of the smoothing process (column 2, lines 42-65; gradients reads on edge level as defined in specification, page 10, line 4); column 5 line 42 to column 6 line 16; gradient calculation provides an edge level);

calculating the gradient of the target pixels based on the calculated edge level (column 2, lines 42-65; column 5 line 42 to column 6 line 16);

obtaining a filter matching an edge angle on the image using the calculated gradient based on a predetermined relationship between the edge angles and the gradients (based upon an orientation and gradients of the edge, the corresponding matching filter is selected, for example, horizontal, vertical, diagonal or anti-diagonal as shown by figure 5) wherein the edge angle is an angle of an array-of edge-forming pixels on the image, wherein the filter has orientation properties that extracts pixels oriented in the same angle direction as the edge angle (column 2 line 15 to column 3 line 13; column 4 line 23 to column 5 line 36; Figures 2A-2D; 3A-3D; 5-6);

executing a first smoothing process on the target pixels using the filter that has been obtained (at least Figures 5, steps 518, 522, 526, 530, 532).

Claim 16 is directed to an apparatus corresponding to the method of claim 9. Therefore, this claim is rejected for the same reasons.

Claim 19 is directed to a computer readable medium that stores a program for executing a noise reduction process to digital images corresponding to the method of claim 9. Therefore, this claim is rejected for the same reasons.

For claim 10, Wang discloses the method, wherein the filter has an extraction area which is wider in the parallel direction parallel than in the direction perpendicular to a given direction (column 1, lines 34-42).

For claim 11, Wang discloses the method, wherein the filter is a median filter (Figure 5; column 2, lines 34-42; column 6, lines 37-62).

Allowable Subject Matter

7. **Claims 7-8 and 12-13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art on record fails to teach or fairly suggests, singly or in combination, calculating the dispersion value of the target pixels when the calculated edge level is lower than the prescribed edge level and executing a second smoothing process on the target pixels using a moving average filter having extraction areas that are smaller as the calculated dispersion value increases as required by claims 7 and 12.

Other prior art cited

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kryukov et al. (US 7,003,174 B2) disclose a removal of block encoding artifacts.

Yuan (US 5,367,385) discloses a method and apparatus for processing block coded image data to reduce boundary artifacts between adjacent image blocks.

Maurer (US 6,915,024 B1) discloses an image sharpening by variable contrast mapping.

Washizawa et al. (US 5,502,710) disclose a recording bit extraction by calculating curvature of pixels in scanning probe microscope.


Moler (US 5,142,592) discloses a method and apparatus for detection of parallel edges in image processing.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kanji Patel whose telephone number is (571) 272-7454. The examiner can normally be reached on Monday to Thursday from 8 a.m. to 6:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lillis Eileen can be reached on (571) 272-6928 The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kanji Patel
Art Unit 2624
4/30/07


KANJIBHAI PATEL
PRIMARY EXAMINER